



Curriculum Intent

Physics is the study of energy and matter and their interactions. The GCSE Physics course provides an interesting and challenging experience to link key physical ideas and understand how they relate to each other.

The course aims for all students to:

- develop essential knowledge, understanding and application of different areas of the subject and how they relate to each other
- understand how society makes decisions about scientific issues and how Physics contributes to the success of the economy and society
- develop competence and confidence in a variety of practical, mathematical and problem solving skills
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- promote students' interest in and enthusiasm for the subject, including an interest in further study and careers associated with the subject.

Autumn/Spring Term | Electricity

Students will learn:-

- Current
- Potential Difference
- Resistance
- Electrical Charge
- Current-voltage characteristics
- Series and Parallel Circuits
- Energy transfers and power
- Direct and alternating potential difference
- Mains electricity
- Energy transfers in everyday appliances
- The National Grid

What does excellence look like?

- Students should be able to draw and interpret circuit diagrams.
- Explain the design and use of a circuit to measure the resistance of a component
- Explain qualitatively why adding resistors in series increases the total resistance whilst adding resistors in parallel decreases the total resistance
- Explain how the power transfer in any circuit device is related to the potential difference across it and the current through it, and to the energy changes over time
- Measure time periods and frequency of an AC supply from a voltage-time graph
- Explain the choice of materials used in a plug with reference to conduction and insulation
- Calculate the appropriate fuse for an appliance when told the current it draws
- Explain why the National Grid system is an efficient way to transfer energy

How will we assess impact?

- Peer and self-assessment
- Previous lesson recap quiz
- Land mark tasks
- End of topic test

Knowledge, understanding & Skills

- Standard circuit symbols
- The equation linking current, charge and time
- The equation linking voltage, current and resistance
- The applications of thermistors in circuits e.g. a thermostat
- The application of LDRs in circuits e.g. switching lights on when it gets dark.
- Use circuit diagrams to construct appropriate circuits to investigate the I-V characteristics of a variety of circuit elements, including a filament lamp, a diode and a resistor at constant temperature.
- Use circuit diagrams to construct and check series and parallel circuits that include a variety of common circuit components
- Describe the difference between series and parallel circuits
- Calculate the currents, potential differences and resistances in dc series circuits
- Solve problems for circuits which include resistors in series using the concept of equivalent resistance
- Describe how different domestic appliances transfer energy from batteries or ac mains to the kinetic energy of electric motors or the energy of heating devices
- Be able to state the mains frequency and voltage in the UK
- Describe the differences between AC and DC current
- State the names and colours of the cables in a UK mains plug
- Describe the dangers associated with the use of mains electricity
- Describe the use of fuses and other safety features in a plug
- Recognise the use of AC or DC in every day home and laboratory appliances
- Describe the use of transformers in the National Grid

How is homework used to enhance learning?

AQA website <https://www.aqa.org.uk/subjects/science>

BBC bitesize <https://www.bbc.co.uk/bitesize/examspecs/zsc9rdm>

Grade gorilla <https://gradegorilla.com/>

Isaac Physics <https://isaacphysics.org/>

AES student science website

<https://sites.google.com/view/angloscience>

Suggested homework tasks

- Learn definitions of key terms.
- Group and independent research projects
- Past examination questions practice

Practical activity preparation, simulations and follow-up

Students will learn:-

- Transverse and longitudinal waves
- Wave properties
- Wave calculations
- Electromagnetic waves

What does excellence look like?

- Recall and apply the wave speed equation
- Manipulate the wave speed equation in complex problems involving converting units
- Recall and apply the relationship between frequency and time period
- Explain how different substances may absorb, transmit, refract or reflect electromagnetic waves in ways that vary with wavelength
- Use wave front diagrams to explain refraction in terms of the change of speed that happens when a wave travels from one medium to a different medium
- Explain why each type of electromagnetic wave is suitable for particular practical applications
- Explain hazards linked to electromagnetic waves

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Knowledge, Understanding & Skills

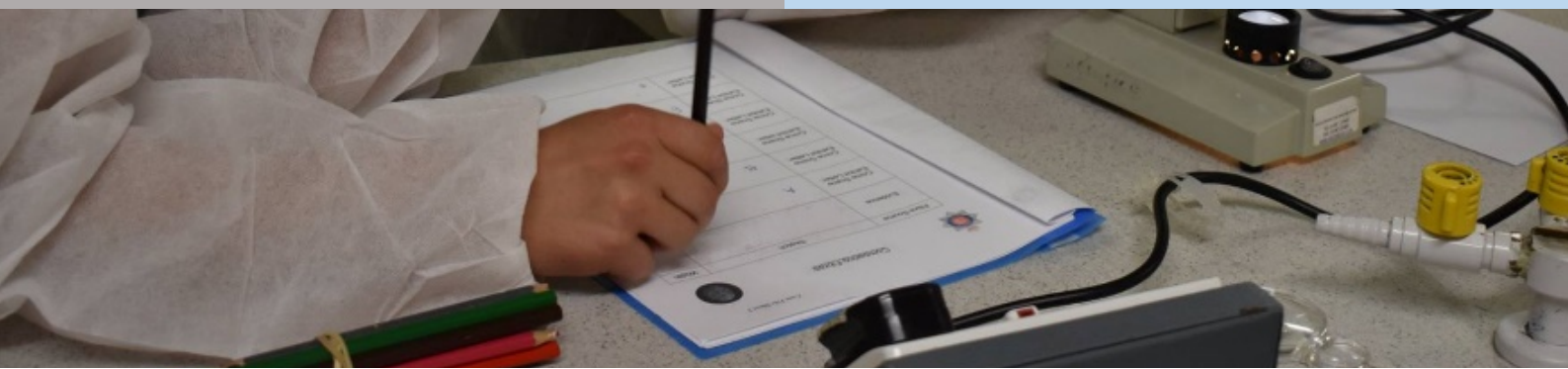
- Describe the difference between longitudinal and transverse waves
- Students should be able to describe evidence that, for both ripples on a water surface and sound waves in air, it is the wave and not the water or air itself that travels
- Describe wave motion in terms of their amplitude, wavelength, frequency and period
- Identify amplitude and wavelength from given diagrams
- Describe a method to measure the speed of sound waves in air
- Describe a method to measure the speed of ripples on a water surface
- Identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements
- Recall the regions of the electromagnetic spectrum
- Give examples that illustrate the transfer of energy by electromagnetic waves

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International Opportunities

Visits Programmes

A wide range of exchange visits are available for year 9 students.

Many visits include Science Museum and significant landmarks

Cross curriculum visit to Iceland

For up to date information, see visits programme.

Within the curriculum

The GCSE Physics curriculum is designed to deepen understanding and appreciation of how the International scientific society collaborates and makes decisions about world scientific issues.

Students are encouraged to research each theme beyond lessons, exploring topical international scientific examples.

Classwork and homework is designed to ensure that they can draw upon a worldwide knowledge of skills, techniques and theoretical understanding required for their examinations and the potential further study of Physics at an International level at global universities.